

## Medieval and Early Modern ivory objects from the excavations of the Budapest History Museum, Hungary

### *Objets en ivoire du Moyen Âge et du début de l'époque moderne provenant des fouilles du musée d'Histoire de Budapest, Hongrie*

Ágnes FONT, Márta DARÓCZI-SZABÓ

---

**Abstract:** Excavations conducted by the Budapest History Museum in the Buda Castle District over the past fifty years uncovered several artifacts made of elephant and walrus ivory—materials rarely found in the Carpathian Basin. Their identification is challenging due to extensive manufacturing, polishing, and use-wear. Earlier Hungarian archaeology often focused on “intriguing” objects, neglecting systematic raw material analysis. A recent reassessment of the museum’s collection has enabled more accurate identifications, revealing that many items once thought to be bone, marble, or stone are actually ivory. These objects most likely reached the region through long-distance trade, diplomatic exchanges, gifts, or as personal belongings. The paper explores these channels of transmission and situates the finds within broader European networks of cultural, technological, and intellectual transfer, drawing on both archaeological evidence and written sources to reconstruct the connections shaping the medieval Carpathian Basin.

**Keywords:** Elephant and walrus ivory, Carpathian Basin, raw material identification manufacturing techniques long-distance trade.

**Résumé :** Les fouilles menées par le musée d'Histoire de Budapest (Hongrie) dans le quartier du château de Buda au cours des cinq dernières décennies ont mis au jour plusieurs artefacts en ivoire d'éléphant ou de morse. Ces matériaux osseux, en particulier l'ivoire de morse, sont rares dans les découvertes archéologiques du bassin des Carpates. L'identification de ces matières premières s'est révélée être une tâche difficile, même pour des experts, en raison de l'ampleur du processus de façonnage, parachevé par un polissage minutieux, et des traces d'usure résultant de leur utilisation. De plus, les tendances historiques en archéologie hongroise ont souvent mis l'accent sur certains objets « intrigants », au détriment d'analyses exhaustives de l'ensemble des découvertes et assemblages archéologiques. Au cours de la dernière décennie, une détermination plus précise des matières premières utilisées dans la diversité des objets a été réalisée en révisant la collection du musée. Cette réévaluation a révélé qu'un nombre significatif d'objets précédemment catégorisés comme os ou autre matériau (marbre, pierre, etc.) étaient en fait en ivoire d'éléphant ou de morse. Les trouvailles et matières premières discutées dans cet article auraient été introduites dans le bassin des Carpates par le commerce à longue distance, des dons, des cadeaux diplomatiques ou des accessoires personnels accompagnant les individus de l'époque. Cet article vise à élucider ces connexions, ainsi que les transferts techniques, technologiques et intellectuels se produisant dans le bassin des Carpates dans un contexte européen plus large, en s'appuyant sur les documents écrits disponibles et les sources archéologiques.

**Mots-clés :** Buda médiévale et moderne, artisanat urbain, réseau commercial, ivoire d'éléphant, ivoire de morse, bassin des Carpates, identification des matières premières, technique de fabrication, commerce à longue distance.

---

## INTRODUCTION

Buda held an important role initially as one of the most significant towns of the Kingdom of Hungary and, from the 1240s, as the capital during the late medieval and early modern periods. Situated in the north-south oriented Castle Hill, the fortified town was strategically founded by King Béla IV (1235–1270) following the Mongol Invasion. Throughout the Middle Ages, Buda played a diverse and crucial role. As one of the main crossing points and stations for transfer trade on the Danube, it exerted considerable economic importance and power. In the late Middle Ages, the palace of Buda emerged as the primary royal residence. The Castle District (tightly interconnected with the suburbs below) encompassed the royal palace, the court with its administrative centre, and the civil quarter, along with various ecclesiastical and civic institutions (Nagy et al., 2016).

Over the last seventy years, archaeological research in the medieval Buda Castle District has brought to light thousands of finished, unfinished, broken, or repaired bone, antler, and ivory objects, as well as manufacturing waste, representing every stage of the working process (*chaîne opératoire*). Objects made of osseous raw materials (including ivory) were involved in both regional and long-distance trade, and included goods produced to meet local or regional needs (e.g. combs, knives, etc.). Since there is limited evidence from written sources and historical records from the region, the identification and examination of archaeological finds are important, serving as direct evidence of the presence of ivory in the Kingdom of Hungary.

### 1. RAW MATERIALS: WALRUS AND ELEPHANT IVORY

In Hungarian terminology, it is common practice to refer to all hard osseous raw materials as bone. Yet bone, antler, teeth and, to a lesser extent, horn (although the latter is archaeologically negligible in Hungary) differ considerably in their structural composition and physical properties. These directly affect their workability and the range of objects that can be produced. The accessibility of these raw materials also varied: the bones of domestic animals could be obtained from slaughter or household refuse, whilst antlers required hunting or seasonal collection. By contrast, elephant ivory and walrus tusks were not locally available in Central Europe and could only have reached the region through import and long-distance trade. Antlers are notably more flexible and easier to work than bone, whereas tooth enamel ranks amongst the hardest substances in the animal kingdom (Bartosiewicz, 2006, p. 170). The carving of domestic animal teeth was already uncommon in medieval Hungary<sup>1</sup>. The use of “exotic” tusks (most frequently those of elephants) was correspondingly rare and largely confined to high-status

contexts. Excavations conducted by the Budapest History Museum in the Buda Castle District have yielded over fifty worked elephant ivory artefacts, whilst a short research project in 2023 identified seven finished objects made from walrus ivory. As these materials are not always easily distinguishable on visual inspection, their structural properties require closer consideration.

Elephant ivory derives from the upper incisors. In the African elephant (*Loxodonta africana* Blumenbach 1797), both sexes develop tusks, whereas in the Asian elephant (*Elephas maximus* Linné 1758) this feature is confined to males. The tusks are composed entirely of dentine, lacking enamel, and may attain lengths up to three metres and weights approaching 85 kg (Macgregor, 1985, p. 17). Their colour ranges from white to yellow-brown. Cross-sections of elephant ivory display the characteristic Schreger lines: intersecting bands forming rhomboidal patterns which constitute reliable diagnostic markers (Locke, 2008). The extent to which these lines are visible in worked pieces depends largely on the orientation of the cut. Archaeological finds frequently exhibit desiccation: as ivory dries, it tends to split and delaminate into plates due to burial conditions.

The walrus, the sole extant representative of the Odobenidae, exists in two subspecies: the Atlantic walrus (*Odobenus rosmarus rosmarus* Linné 1758), and the Pacific walrus (*Odobenus rosmarus divergens* Linné 1758). Their tusks are modified upper canines: rootless and continuously growing throughout the animal's life (Dudich and Loksa, 1978, p. 640). Bull tusks may reach 1 m in length and weigh up to 5 kg, whereas those of cows are considerably smaller and lighter (Lemoine and Darwent, 1998, pp. 74–75). Its cross-section reveals three distinct layers: an outer thin cementum band, a thick, uniform layer of dentine, and a darker central zone of granular or “marbled” dentine. (Macgregor, 1985, p. 20, fig. 19). Where this inner zone is exposed on a finished object, identification is relatively straightforward; in its absence, differentiation from elephant ivory may only be achieved by microscopic examination.

In order to assess the natural shape, size, morphology of the tooth, skulls in the collections of the Hungarian Natural History Museum and the Natural History Museum in Vienna were examined. The Hungarian collection preserves a single specimen, whilst the Viennese holds five, all of which retain measurable tusks<sup>2</sup>. Although sex was recorded for only three of the animals, pronounced sexual dimorphism allowed the sex of two additional adults to be inferred. In total, two cows from Greenland, one specimen from an unknown location<sup>3</sup>, and two bulls (from Alaska and Russia respectively) were studied. The Greenland cows exhibited tusk lengths of 28, 29 and 32 cm, whereas the Alaskan bull possessed tusks measuring 50 and 57 cm. The tusks of bulls were not only longer but also of greater diameter than those of cows.

Anatomical features of walrus tusks place certain constraints on their exploitation. As rootless canines, their basal extremities—where they fit into the skull—are hollow and therefore unsuitable for working. Only fur-

ther along the tusk does the darker, granular dentine fill the cavity. In addition, the tusk tapers gradually towards the tip. These properties permit the identification of the specific section of tusk from which many objects were produced.

## 2. THE ROLE AND IMPORTANCE OF WALRUS IVORY IN MEDIEVAL-EARLY MODERN TRADE

In the Middle Ages, walrus ivory was sourced from the North Atlantic regions, the animals' natural habitats. The establishment of trading depots and settlements at the end of the 9th century (including in Greenland, due to the Viking expansion) was a key stage in its spread. Ivory became readily available and it could therefore be sourced and processed on a continuous basis. Two key periods for its use and trade were the 10th–11th and 12th centuries (Barrett, 2021, pp. 173–174). In the late 10th and during the 11th century, walruses appeared in several written sources, as diplomatic gifts and later as tithes. It is interesting to note that in various types of sources (such as travel narratives, or administrative records) these objects are often referred to as fish teeth, not only in Western European written sources but also in the medieval Arab world (Barrett et al. 2020, p. 7). The establishment and operation of several workshops (mainly in Germany and Russia, e.g. Bergen, Schleswig or Novgorod, but also in Dublin and London), which were engaged in the processing of walrus, among other things, can be dated to this period. This is confirmed by the large quantities of unworked clay that have been found in archaeological excavations in these cities (Barrett et al. 2020, p. 2). The farther we move from the regions where this raw material originates, the more valuable walrus ivory becomes. This applies both to the material itself and to the objects made from it. Its value increases not only in practical, material terms, but also in terms of symbolic or cultural meaning. For the finished products, this is reflected in the design, function, character and decoration of the object (Barrett, 2021, p. 173).

At the height of European Romanesque art, in the 12th century, the use of walrus ivory culminated, but from the 13th century onwards, elephant ivory became dominant and began to replace the use of walrus tusks. Elephant tusks were becoming increasingly available and, because they were inherently larger and more homogeneous in material than walrus tusks, these properties made them more suitable for making a variety of objects and tools. By the Gothic period, many liturgical and profane objects were made of ivory, and although walrus ivory remained in use, it was much less prevalent (Barrett, 2021, pp. 174–177). Walrus ivory objects circulated across Europe via long-distance trade routes, whether overland, maritime, or fluvial. By the 15th and early 16th centuries, the material—both in worked and raw form—had reached markets in the Near East and

even the Far East, primarily through Novgorod, Russia, and Bulgaria (Dectot, 2018, p. 167).

Written sources indicate that walrus and elephant ivory objects were primarily recorded as diplomatic gifts or taxes. During the 17th century, Russian tax payments to the Crimean Tatar Khanate included exotic materials such as ivory and pelts, valued at 10,000 roubles in 1636 (Ivanics, 1994, 34).

As a vassal state of the Ottoman Empire from the late 15th century, the Khanate likely mediated the distribution of walrus ivory and objects made from it via taxes and gifts. Walrus ivory could also have reached the Sultan's court through other routes and intermediaries, where it was used for belt ornaments, combs, and dagger and sword handles during the reign of Suleiman I (1520–1566; Meric, 1963, pp. 766–770). Among these, yatagans—long, single-edged knives or short sabres with characteristic walrus ivory handles, used for both stabbing and cutting (Vigh, 2004, pp. 730–731)—are quite important to mention, although they are mostly present in historical collections, and less likely to appear in excavation materials. The widespread use of this type of weapon dates back to the end of the 17th century among the Turks (Sudár and Szölsöy, 2014, p. 219), while the pieces in private collections in the case of Hungary are mostly from the 18th and 19th centuries (Sudár and Szölsöy, 2014, p. 228). One of the earliest known (ornamental) yatagan was made for Suleiman II around 1526, but the handle is not made of walrus but of elephant ivory (Vigh, 2004).

The role of England and the Netherlands in walrus hunting and the use of walrus increased alongside Russia from the 17th century onwards (Rijkelijhuizen, 2009, p. 415). According to a written record from 1608 (Houttuin, 1761, pp. 11–12), a total of 900 walruses were killed, and it was important to capture not only the hunted animals but also the live ones, which were used as an exotic spectacle. The boom in walrus hunting in the Netherlands, however, was quickly eclipsed by whaling, due in part to the large depletion of the population from intensive hunting. (Rijkelijhuizen, 2009, p. 416). At first, the animals' blubber, skin and fat were exploited in addition to the walrus tusks, but after a while, the focus was explicitly shifted to the acquisition of walrus skulls and tusks. At the same time, the elephant ivory trade became more prominent in Dutch territories, often being transported together with walrus tusks in the 17th and 18th centuries. However, Russian exports continued to play a prominent role in the trade of walrus tusks as a raw material (Rijkelijhuizen, 2009, p. 416).

## 3. OBJECTS MADE OF WALRUS IVORY FROM THE COLLECTION

A total of six objects from the walrus collection have been identified. They are presented below with their detailed data and descriptions. So far, no other historical source about walrus ivory or objects made of this type of

raw material appears to be available from medieval and early modern Hungary, but this may change in the course of further research.

### 3.1. Knife handle (inv. no. 51.111; fig. 1)

Circumstances of discovery: 1951, Royal Palace (L. Gerevich), pit no. 31 (North Gate Tower), –4.5–5 m.

Dating: 15th–16th century<sup>4</sup>

Description: the knife handle's end (sealing element) is 23 mm long, with a circular cross-section at the top and an oval cross-section at the bottom where the tip protrudes like a boot. Traces of iron are still visible. The tusk was shaped by longitudinal splitting: its cross-section is a regular polygon of eleven sides, the edges are rounded. On both sides the central, texturally distinct dentine is visible, gradually diminishing, then disappearing, indicating that the tip of the knife-edge was formed from the tip of the canine, which already limited the possible size.

Size: 15.4×15.6 mm, 18×24.1 mm, weight: 11.6 g.

### 3.2. Knife handle (inv. no. 74.5.1; fig. 1)

Circumstances of discovery: 1974, Northern Courtyard (L. Zolnay), no. 74/3

Dating: 13th century

Description: A curved cross-sectioned knife or tool handle with a rounded point at one end and a straight cut edge at the other end, with remains of iron parts. The secondary dentine runs along the length of one side of the knife handle showing that the object was made of one half of a longitudinally split tooth<sup>5</sup>. The surface is smooth and polished. Around the end of the handle, there are notches and incisions are on both sides.

Size: 139.6×19×13.4 mm, weight: 49.7 g.

### 3.3. Knife handle (inv. no. 2021.11.20.1–2; fig. 1)

Circumstances of discovery: 2018, 6 Szentháromság square (A. Tóth), section 11, SE 88 (Ottoman pit)

Dating: second half of 16th century<sup>6</sup>

Description: A regular polygonal knife handle with a spiked handle end, chipped (or smoothed?) eleven-sided, poorly retained, and split lengthwise. Size: 28.9×23.4×17.5 mm; 28.3×18.7 mm, weight: 17.6 g.

### 3.4. Knife handle (inv. no. 2021.49.73; fig. 2)

Circumstances of discovery: 2015, Carmelite building complex (A. Papp), SE 998

Dating: second half of the 17th century

Description: the knife handle is boot-shaped, with simple spike-type blade design, an oval cross-section, and a polished surface. There are remains of the iron blade. The end close to the blade's spike is heavily damaged.

Size: Overall length including the remaining stump of the blade is 67.9 mm, length of the handle 61.7 mm, width at the end of the flared handle 21.4 mm, 19.1 mm at

the end towards the blade; depth 26.2 mm, 21.1 mm at the half towards the blade, which is distorted essentially by the cracking caused by the corroded iron. Weight: 39.3 g.

### 3.5. Belt buckle<sup>7</sup> (inv. no. Cs. 537b; fig. 2)

Circumstances of discovery: 1941, 41 Csalogány Street (S. Garády), north-west corner of the excavated area, –1.2 m

Dating: 16th–17th century<sup>8</sup>

Description: thick, oval sheet broken crosswise, with one curved end intact. On two sides of this section are four to four wavy lines of progressively smaller arches from the bottom up, with a donkey-arched projection in the centre. Parallel incisions have been made at the base of the widest ripples, and only one between the others. A small hole (about 0.6–0.7 mm in diameter) was drilled onto the surface on each side of each of the spurs, but these do not pass through the object, i.e. they have no functional role, only decorative. The two-coloured pattern typical of walrus tusk is clearly visible on one side, but on the other side something has discoloured it. The object was formed from a piece obtained by the longitudinal splitting of the canine tooth. From its dimensions, it is likely that a bull's tusk was used.

Size: 50.3×47.5×7.2–7.8 mm, weight: 20.6 g.

### 3.6. Archery ring (inv. no. 2020.17.1, fig. 2)

Circumstances of discovery: 2015, Carmelite building complex (A. Papp), SE 998

Dating: second half of the 17th century<sup>9</sup>

Description: The archery ring has the most common form of these types of objects with the tongue at a steep angle. The lower edge is not cut at right angles but slopes slightly towards the outside.

Size: 33×36×22 mm; diameter: 27 mm; angle of the tongue: 112°, weight: 3.6 g.

The six walrus ivory objects from the excavations of the Budapest History Museum bring Hungary's total to eight, yet they remain extremely rare. The abbatial staff from Veszprémvölgy dates to the 11th century (Fülöp and Koppány, 2004), while the belt ornament from Barcs (Gál and Kovács, 2011; Gál, 2016) dates to the Ottoman period. Three of the four knife handles made from walrus ivory in the Castle Museum collection have a boot-shaped end, two of which (51.111 and 2021.11.20.1–2, fig. 1) are similarly sized and may form composite handles. In the other two, the tool or knife handle is made entirely of walrus ivory. The piece found in the Carmelite monastery is also boot-shaped (fig. 2). The one from the Northern courtyard is simpler, rounded (fig. 1), with parallels only abroad, such as Tallinn (13th–14th century) and Novgorod (Luik and Russow, 2014), and Vilnius (13th–18th century; Luik et al., 2019).

The closest parallels to the belt buckle from Csalogány Street (although it is similar in form to the piece from Barcs) are found in the collection of the Topkapi Palace.





**Fig. 1** – Knife and tool handles made of walrus ivory from the Castle Museum's collection.  
*Fig. 1 – Poignées de couteaux et d'outils en ivoire de morse de la collection du Castle Museum.*



**Fig. 2** – Knife handle, archer's ring, belt buckle made of walrus ivory from the Castle Museum's collection.  
**Fig. 2** – Poignée de couteau, anneau d'archer, boucle de ceinture en ivoire de morse de la collection du Castle Museum.

Unlike the piece from the Castle Museum (fig. 2), these objects are intricately decorated. Unfortunately, it's not possible to determine whether this piece was intended to have carved decorations on its surface, but was damaged, or it is a finished, undecorated belt buckle. If the piece is unfinished due to the damage, it could be an important piece of evidence of local walrus ivory working, through the presence of the Ottoman-Turkish Empire in Hungary. The closest parallel to the archer's ring was found in an auction house in Britain, although that piece (also made of walrus ivory) dates to the 18th and 19th centuries.

While it is clear that the objects on display were brought to the Carpathian Basin either by long-distance trade or by gift (perhaps with their owners), the social or prestige value of everyday items like knife handles remain uncertain.

#### 4. OBJECTS MADE OF ELEPHANT IVORY FROM THE COLLECTION

As more than 50 ivory objects have been unearthed in the excavations of the Budapest History Museum in recent decades, this study can only provide a short overview. Most elephant ivory objects were everyday tools—such as composite knife handles, combs, decorated cover plates, and sundials, which were once common from the 16th century but are now unique to researchers.

Recently, fragments of rounded gunpowder holders have been identified based on formal analogies. Many of the objects in the collection, especially the combs, show strong signs and traces of use, both under the microscope and with the naked eye. The characteristic identification marks of the raw material are also clearly visible. The Schreger lines, which form the typical rhomboid shapes in the elephant ivory, can be observed if the raw material was cut in cross-section at an early stage in the manufacturing process or *chaîne opératoire*. Longitudinal stripes, resulting from longitudinal cutting and fragmentation are also present on some of the finds, depending on how the raw material was pre-shaped and cut.

##### 4.1. Knife handle (inv. no. 51.2926; fig. 3)

Circumstances of discovery: 1951, Royal Palace (L. Gerevich), Great Rondelle, 1st layer

Dating: 17th-18th century

Description: Knife handle with most of the corroded blade preserved. The handle was carved from a single piece of elephant ivory, with a hole drilled into its centre. It is cracked lengthwise in four places. Its cross-section is rectangular with the corners cut off, forming an octagon.

Size: 57.9×16.6×9.7 mm

##### 4.2. Comb (inv. no. 51.2157; fig. 3)

Circumstances of discovery: 1951, Royal Palace (L. Gerevich), pit no. IV. (Cellar)

Dating: 15th-16th century

Description: Double-sided comb, some of the teeth are broken. At their base traces of the manufacturing process, engraved lines associated with the manufacturing process are clearly visible. Traces of use-wear are also visible on the surface.

Size: 73×56×0.35 mm

##### 4.3. Comb (inv. no. 52.2268, fig. 3)

Circumstances of discovery: 1950, Royal Palace (L. Gerevich), External Buttress, 2nd layer

Dating: 17th century

Description: Fragment of a comb. The side with the finer teeth is intact, some of the teeth are broken off. Originally double-sided, with traces of intensive wear: after the teeth on one side were completely, or more or less broken off, that side was carefully ground down, but still shows traces of the bases of the thicker teeth. In this way the comb remained still useable after its reshaping.

Size: 46.4×46.5×4.3 mm

##### 4.4. Comb (inv. no. 83.184; fig. 3)

Circumstances of discovery: 1974, Northern Courtyard (L. Zolnay), no. 74/3

Dating: 14th-15th century

Description: Restored double-sided comb. On the finer side, most of the teeth are intact. Traces of wear are visible mainly on the lower part of the teeth on the finer side, while on the coarser side the wear is concentrated on the upper parts.

Size: 66.6×64.8×3.1 mm

##### 4.5. Object of unknown purpose (inv. no. 51.543; fig. 4)

Circumstances of discovery: 1950, Royal Palace (L. Gerevich), Great Rondelle, 2nd layer

Dating: 16th century

Description: Originally identified as a "bone handle". Massive, roughly rectangular, hammer-like object, with a rounded tip at one end, and straight at the other, widening slightly towards the pointed end. The interior still shows the anatomical features of the tusk. Along its longitudinal axis are two drilled holes (diam. 9 mm), with a corroded iron rivet between them. The entire surface is well-polished; file marks are visible near the medullary cavity and along the edges.

Size: 90.1×38.9×23.8 mm

##### 4.6. Component of a composite object (inv. no. 82.285; fig. 4)

Circumstances of discovery: 1980, Northern Courtyard (L. Zolnay), no. IV.

Dating: 15th century

Description: Fragment of a turned ivory object with a screw-threaded side. Its base is slightly concave. Decora-



**Fig. 3** – Knife handle, combs made of elephant ivory from the Castle Museum's collection.  
**Fig. 3** – Poignée de couteau, peignes en ivoire d'éléphant de la collection du Castle Museum.



tion consists of concentric double circles on the rim and at the centre, with a further dot-circle motif at the middle (either part of the decoration or a turning mark). Under strong light, the central motif appears like radiating sun-rays. The sides also carry decoration: above the base rim a small groove, then a plain band, followed by five small incised dots c. 3 mm apart. The object is cracked lengthwise in several places.

Size: 12.1×19×17.1 mm

#### 4.7. Plate (inv. no. 51.296; fig. 4)

Circumstances of discovery: 1951, Royal Palace (L. Gerevich), stray find

Dating: second half of the 17th century

Description: Originally described as a “bone handle”. Oval, straightened by filing on the interior side, highly polished on the exterior. Its convex side has an unusual pattern: three longitudinal holes (diam. 4.2 mm), one retaining metal rivets. A small piece is broken from the narrower end.

Size: 44.5×23.3×6.2 mm

#### 4.8. Powder flask (no inventory number; fig. 4)

Circumstances of discovery: 2000, Teleki Palace (D. Nyékhelyi), LA/3, Cistern

Dating: second half of the 17th century

Description: Hollow ivory piece, with visible turning marks on its interior. The exterior surface is shiny, strongly polished, with both turning traces and characteristic Schreger lines of ivory visible to the naked eye. On both sides are holes indicating suspension or attachment; between them, centrally placed, one larger and one smaller threaded hole indicate the position of the pouring spout. One of its panel is damaged, its surface is cracked.

Size: 72.8×27 mm

#### 4.9. Sundial (inv. no. 2022.9.2; fig. 4)

Circumstances of discovery: 2001, 1–3 Csónak utca (Anikó Tóth)

Dating: second half of the 17th century

Description: Heavily damaged but clearly identifiable as part of the upper plate of a 17th century diptych sundial. The dial is marked 6-12-6, with Roman numerals. The hour lines here are clearly visible and accurately executed. The fittings for attaching it to the horizontal plate are preserved. Despite the heavy damage, traces of decorative elements are still visible on the exterior. Some irregularities are present—most notably the double main axis line. Compass-drawn circle marks are visible, as on the other piece, as well as grinding marks linked to the early stages of preparation.

Size: 51×41×3 mm

In the medieval and early modern periods, elephant ivory reached the Carpathian Basin primarily as finished

luxury products via long-distance trade. These objects are regarded as luxury items within the frame of Hungarian research. In the case of elephant ivory objects from Buda, L. Zolnay also raises the possibility of local processing and working, but L. Zolnay doesn't provide any sources, data or evidence to support this. Trade from Western European towns and urban centres (Nuremberg and other German cities) provided everyday objects (such as combs and knives). In the 16th century due to the Ottoman-Turkish occupation, elephant ivory objects were also present through the Ottoman Empire, either as personal objects or diplomatic gifts (Choyke and Kováts, 2010, pp. 117–118). Hungarian scholarship generally holds that ivory was never available locally and was introduced only as finished goods. However, according to historical written sources of the early modern period, this theory seems to have been overturned by the presence of Hutterite settlers called *habán* in Hungary. They were associated with the Reformation process in the 16th and 17th century and arrived and settled in the Principality of Transylvania between 1621 and 1623, after a long period of persecution through Western and Central Europe (Katona, 1983, p. 15).

From the 17th century, written sources exist concerning their communities and typical handicraft products (account books, pricing lists). The Hutterite craftspeople excelled in pottery, stove tile-making, knifemaking, and metalworking, among other specialized craft activities. Their high-quality, distinctive products and their specialized activities not only contributed to local trade but also made their communities indispensable in the areas where they settled (whether in an urban environment or on a lord's estate; Katona, 1983, p. 7). This was not just a fulfilment of their religious principles (hard-working, discipline, diligence). Craft specialization also had a deeper, implied meaning, providing a means of retaining a degree of power and protection for their communities while meeting local demands for a wide variety of products.

The only written source we have found on the acquisition of elephant ivory as a raw material comes from the Principality of Transylvania and relates to the Habán communities: “Tem: Sir Mihály Toldalaghi has just sent a note that in anno 1623 praeterito his majesty by his gracious commandment of the new Christians in the Sublime Porte he has bought elephant tooth, mother of pearl, berzseny-tree... talleris” (Radvánszky, 1888, p. 104).

## CONCLUSION

The reassessment of the Budapest History Museum's collection demonstrates that both elephant and walrus ivory objects, although rare in the Carpathian Basin, offer significant insights into the circulation of “exotic” raw materials and the operation of long-distance exchange networks in the medieval and early modern periods. The more precise identification of these finds has expanded our understanding of the variety, function and social



**Fig. 4** – Sundial, flask for gunpowder, unidentified tools, objects made of elephant ivory from the Castle Museum's collection.

**Fig. 4** – Cadran solaire, flacon pour poudre à canon, outils non identifiés, objets en ivoire d'éléphant de la collection du Castle Museum.

value of walrus and elephant ivory artefacts in Buda and its wider region. These objects attest not only to Buda's importance as a political and economic centre, but also to its role as a conduit of cultural and technological transfer within Europe. Furthermore, the evidence for ivory working connected with specialised communities, such as the Habán, illustrates how craft practices could embody both economic utility and social resilience. Collectively, the ivory objects from Budapest illuminate the entanglement of local and global spheres, reflecting the ways in which exotic materials and their crafted forms were integrated into the cultural fabric of the medieval and early modern Kingdom of Hungary.

**Acknowledgements:** We would like to thank Dr. T. Görföl (Hungarian NHM), F. Zachos and A. Bibl from the Naturhistorischen Museum in Vienna for allowing us to do our research. Thanks to L. Daróczi-Szabó for his help with the study.

### NOTES

1. The BTM collection holds a single example: a dog jawbone amulet with preserved teeth, mounted in a metal socket. Inventory number: 51.3071.
2. Their inventory number: A-02625; NMW 4038, ID 64536; NMW 18455, ID 64522; NMW 18458, ID 64538; NMW 3786, ID 64528, and one of the skulls in Vienna had no inventory number. The latter animal died young, so although we measured its tusks, the values obtained could not be used in further studies and comparisons.
3. This last case is quite interesting, because while the length of its canines clearly suggested a cow, the thickness of the canines would make them closer to bulls.
4. The finds recovered from the layers (a number of pottery from the Ottoman period in Hungary and a large number of coins from the years 1540–1642, which are more abundant in the medal material) suggest that this fill was formed in the second half of the 17th century, but before the great destruction of the castle.
5. The material's uniqueness was likely noted during excavation or inventory, recorded incompletely in the inventory book as "the handle is said to be." Later, L. Zolnay identifies the knife as made of walrus ivory, presumably referring to the same object. (Zolnay, 1982, p. 424).
6. Accompanying finds (e.g. an Iznik faience plate, a Chinese porcelain bowl, a sgraffito footstool and a silver archery ring) date the filling of the pit to the second half of the 16th century.
7. The object resembles a 16th century walrus ivory belt buckle from Barcs (Gál and Kovács, 2011; Gál, 2016), sharing edge decoration style and drilled patterns, suggesting a similar function. This was supported by three identical 16th-century walrus tusk buckles in the Topkapi Palace Museum catalogue. Unlike the decorated examples, the Csalogány Street piece is undecorated, likely because it was broken during manufacture, and is unfinished.
8. S. Garády (excavating archaeologist) dated the object to the 15th century, based on a Sigismund denarius found nearby, but parallels suggest 16th–17th century use. Carbon isotope analysis failed due to the marine reservoir

effect. Later dating is also supported by the proximity of Rüstem Pasha's mosque during the Turkish period.

9. The ring lay in a room of the 17th century palace of the Buda Beylerbey nobility. The top of the pit was covered with rubble from the wars of reconquest, and the finds were dated to the second half of the seventeenth century from Venetian and Dutch gold coins. The object can be linked to the court of the last pasha of Buda (Papp and Sudár, 2018, p. 316).

**Ágnes FONT**

Budapest History Museum, Department of  
Medieval Archaeology, Budapest, Hungary  
fontagnes95@gmail.com

**Márta DARÓCZI-SZABÓ**

Budapest History Museum, Department of  
Medieval Archaeology, Budapest, Hungary  
martidsz@gmail.com

## REFERENCES

- BARTOSIEWICZ L. (2006) – *Régenvolt háziállatok. Domestic animals in the past: Introduction to zooarchaeology*, Budapest, L'Harmattan Kiadó, 224 p.
- BARRETT J. H. (2021) – The exploitation of walrus ivory in medieval Europe, in X. Keighley, M. T. Olsen, P. Jordan, and S. Desjardins (eds.), *The Atlantic Walrus. Multidisciplinary insights into human-animal interactions*, Academic Press, pp. 169–196.
- BARRETT J. H., BOESSENKOOL S., KNEALE C. J., O'CONNELL T. C., STAR B. (2020) – Ecological globalisation, serial depletion and the medieval trade of walrus rostra, *Quaternary Science Reviews*, 229, pp. 1–15.
- CHOYKE A. M., KOVÁTS I. (2010) – Tracing the personal through generations: Late Medieval and Ottoman combs, in A. Pluskowski, G. Kunst, M. Kucera, M. Biertak, and I. Hein (eds.), *Bestial mirrors: Using animals to construct human identities in Medieval Europe*, Wien, Vienna Institute for Archaeological Science (Animals as Material Culture in the Middle Ages Series, 3), pp. 115–127.
- DECTOT X. (2018) – When ivory came from the seas. On some traits of the trade of raw and carved sea-mammal ivories in the Middle Ages, *Anthropozoologica*, 53, pp. 159–174.
- DUDICH E., LOKSA I. (1978) – *Állatrendszertan*, Budapest, Tankönyvkiadó, 708 p.
- FÜLÖP A., KOPPÁNY A. (2004) – A crosier from the territory of the Veszprémvölgy convent, *Acta Archaeologica Academiae Scientiarum Hungaricae*, 55, pp. 115–135.
- GÁL E. (2016) – Objects made from tusk, bone, and Antler from the Ottoman-Turkish fort at Barcs, Hungary, in G. Kovács and C. Zatykó (eds.), *“Per sylvam et per lacus nimios.” The Medieval and Ottoman period in Southern Transdanubia, Southwest Hungary: The contribution of the Natural Sciences*, Budapest, MTA BTK Régészeti Intézet, pp. 133–143.
- GÁL E., KOVÁCS G. (2011) – A walrus-tusk belt plaque from an Ottoman-Turkish castle at Barcs, Hungary. *Antiquity*, 85, 329, pp. 1–5.
- IVANICS M. (1994) – *A Krimi Kánság a tizenöt éves háborúban*, Budapest, Akadémiai Kiadó, 235 p.
- KATONA I. (1983) – *Habán művészeti emlékek Magyarországon*, Budapest, Múzsák Közművelődési Kiadó, 240 p.
- LEMOINE G. M., DARWENT C. M. (1998) – The walrus and the carpenter: Late Dorset Ivory working in the High Arctic, *Journal of Archaeological Science*, 25, pp. 73–83.
- LOCKE M. (2008) – The Structure of ivory, *Journal of Morphology*, 269, p. 423–450.
- LUIK H., RUSSOW E. (2014) – Morsakihvast käepidemega nuga Tallinnast/Knife with walrus ivory handle from Tallinn, in Ü. Tamla and V. Lang (eds.), *About time and space. Studies in honour of Mare Aun*, Tallinn, Ajaloo Instituut (Muinasaja teadus, 25) pp. 107–124.
- LUIK H., PILIČIAUSKIENĖ G., BLAŽEVIČIUS P. (2019) – Late Medieval and Early Modern bone and antler working in the Vilnius Castle Complex, *Cuadernos de Prehistoria y Arqueología de la Universidad de Granada*, 29, pp. 187–201.
- MACGREGOR A. (1985) – *Bone, antler, ivory and horn. The technology of skeletal materials since the Roman Period*, London, Routledge, 258 p.
- MERIC R. M. (1963) – Bayramlarda Padişahlara Hediye Edilen San'at Eserleri ve Karşılıkları. I. Sûret-i defter oldur ki usta kârlar bayramlık getürdiklerin beyân ider, *Türk San'ati Tarihi Araştırma ve İncelemeleri*, 1, p. 766–770.
- NAGY B., RADY M., SZENDE K., VADAS A. (2016) – *Medieval Buda in Context*, Leiden – Boston, Brill (Brill's Companions to European History, 10), 578 p.
- PAPPA A., SUDÁR B. (2018) – Oszmán íjászggyűrűk a Budapesti Történeti Múzeum gyűjteményéből, *Budapest Régiségei*, 51, pp. 307–322.
- RADVÁNSZKY B. (1888) – *Házi történelmünk emlékei. Udvartartás és számadáskönyvek: Bethlen Gábor Fejedelem udvartartása*, Budapest, Athenaeum, 432 p.
- RIJKELIJKHUIZEN M. (2009) – Whales, walruses, and elephants: Artisans in ivory, baleen, and other skeletal materials in seventeenth- and eighteenth-century Amsterdam, *International Journal of Historical Archaeology*, 13, 4, pp. 409–429.
- SUDÁR B., SZÖLLŐSY G. (2014) – A Hadtörténeti Hídfegyver Gyűjteményében őrzött jatagánok egy sajátos csoportja/A Special Group of Yatagans in the Edged weapons collection of the Hungarian Military History Museum, *Acta Musei Militaris in Hungaria*, 14, pp. 219–237.
- VÍGH I. (2004) – Szulejmán szultán jatagánja és a mohácsi csata, *Hadtörténeti Közlemények*, 117, 2, p. 730–738.
- ZOLNAY L. (1982) – *Az elátkozott Buda - Buda aranykora*, Budapest, Magvető, 605 p.